

Memorandum

Peer review of the Mt Buller water supply augmentation options assessment

To: Jon Brock and Alicia Burnett, ERM

From: Chris Olszak (Aither) and Brett Tucker (Blackwatch Consulting)

Date: Monday 26 June 2017

Purpose

To provide a high level, independent peer review of the robustness of the options assessment process used to justify a proposed water storage augmentation at Mt Buller, Victoria.

Summary of main findings

- Existing water licencing and storage capacity for Mt Buller Resort is insufficient to meet current and future demands and is resulting in regular breaches of current water extraction licence requirements.
- In the absence of an additional extraction licence(s) and/or suitable groundwater availability, additional surface water storage is required.
- The whole-of-life cost of creating additional “on-mountain” storage is more cost effective than “off-mountain” storage, driven largely by the avoidance of annual pumping costs associated with elevation to 1800m.
- The augmentation of existing storage capacity in Sun Valley reservoir has been previously ruled out for geotechnical and water quality reasons¹.
- Similarly, the likely success of augmenting in-stream storage capacity has been previously ruled out due to environmental impacts and the low likelihood of obtaining planning approvals.
- With the above constraints in mind, an “on-mountain”, “off-stream” storage is the most viable option for Mt Buller. The reviewers have not been asked to consider the required or optimal size of the storage, noting that this has however been investigated in prior studies and investigations including the Resort’s Water Supply Demand Strategy².

¹ Aither was not requested to review Geotechnical reports for Sun Valley Reservoir.

² Aither was not requested to review the prior studies into supply/demand balance and storage size.

- GHD assessed the relative merits of three potential locations for a 100ML storage using Multi-Criteria Analysis. Based on the MCA analysis, GHD concludes “Control” as the preferred location of the new storage. Robust analysis appears to support this conclusion, although the limited geotechnical investigations to date represent some risk to this conclusion (and we note that we are not geotechnical experts).

Background

Mt Buller Resort has significant constraints on its water supply for potable demand and snowmaking requirements.

The Resort is licenced to extract 700ML of water a year from Boggy Creek. The water must be extracted between the months of May and October (inclusive) and the current licence provides sufficient water to meet current and projected annual potable and snow making requirements. However, due to a lack of storage, the full water allocation cannot be extracted, and in the past Mt Buller has been required to extract water during the summer months, in breach of its licence conditions and with associated impacts on the flows of Boggy Creek.

A Key Commitment of the Mt Buller & Mt Stirling Resort Management Plan 2013-2018 (which we understand has been endorsed by the Minister for Environment and Climate Change on 13 Nov 2013) is to “Develop an additional Water Storage Facility for snowmaking and potable water supply, as detailed within the Resort’s Water Supply Demand Strategy.”

The Water Supply Demand Strategy prepared by GHD dated May 2013 recommended an additional raw water storage capacity between 100 and 150ML is ultimately required depending on need to meet future peak demand in low inflow years. We note that the Resort Management Board (RMB) has taken the lower end of this range, 100 ML, as the basis of its options assessment.

We understand that the proposed Project has been submitted for planning approval to the Victorian Government. We understand that to support the planning application process, the RMB (via its planning advisor ERM) is seeking an independent assessment of the robustness of the options assessment process that resulted in the selection of the preferred option.

Aither has been engaged by ERM to undertake a limited peer review of the GHD Options report and associated supporting documentation, the results of which form the basis of this report. The review team consists of Mr Chris Olszak (Director, Aither) and Mr Brett Tucker (Director, Blackwatch Consulting) (the review team). Credentials of the review team are provided at the end of this memo.

Scope

The review team was asked to provide an independent view on the robustness of the options assessment process. We were specifically asked to consider:

- On mountain versus off mountain storage
- In stream versus off stream storage
- Possible site locations for new storage

We note the following limitations surrounding the scope of our review:

- we undertook the assessment on the basis that no further consideration of storage size was required (i.e. we have not reviewed the water balance assessment)
- our review was based solely on a rapid desktop review of a range of documents provided by ERM – primarily consultants reports by ERM, GHD and AECOM
- we assessed the robustness of the options assessment process and conclusions reached but did not verify or validate any of the technical assessment work undertaken by advisors in the past
- we have assumed that no changes can be made to existing licence conditions and that a move to achieve compliance is mandatory
- we have applied general expertise and interpretation to the Geotechnical results but we are not qualified to provide expert peer review of same. Aither has relied on interpretative results and conclusions from GHD reports.

Aither Pty Ltd and the review team members do not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information. Our report is to be construed as an independent view on the conclusions reached through the options assessment process, based on the caveats outlined above.

Findings: On mountain versus off mountain storage

GHD's 2016 investigation considers the option of an equivalent storage constructed "off-mountain". The report concludes that despite some advantages of an off-mountain storage, it should be ruled out as an option on the basis of:

- Costs – increased capital costs and significantly increased operating costs due to pumping.
- Environment – impacts from the construction of a pipeline route and from additional emissions associated with pumping.

Although the analysis is relatively high level, the review team supports the recommendation. Without an offsetting reduction in upfront capital costs, whole of life costs will be dominated by significantly higher pumping costs as water is conveyed to the top of the mountain. The GHD comparison figures of \$500,000 versus \$200,000 for annual pumping costs from the storage are not unreasonable.

Findings: In stream versus off stream storage

Instream storage would involve works to augment the capacity of existing weirs or alternatively the construction of new works across Boggy Creek, to impound water in-stream for pumping back to the resort.

The 2016 GHD report itself does not consider the relative costs and benefits of in-stream versus off-stream storage. However, the 2008 Maunsell (AECOM) report does provide some qualitative analysis, dismissing this as a viable option on the basis of unfavourable responses from the regulatory authorities at the time:

"G-MW is not likely to approve an online storage structure on Boggy Creek out of environmental concerns. An online structure would impact on local ecology with the increase

in siltation at the storage likely to change creek morphology and modify nutrient transfer. An online storage would also have implications on the flow rates downstream of the dam.....Maunsell has also contacted, via telephone, the Goulburn Broken Catchment Management Authority (GBCMA) to discuss environmental flows. GBCMA advised that the Delatite River is already very stressed. For this reason, the GBCMA advised that extractions from Boggy Creek should only be undertaken during the winter months” (Maunsell 2008)

Whilst this option was dismissed early in the options assessment, without knowledge of both quantitative and qualitative evidence of benefits and costs, the reviewers accept that it was not an unreasonable assumption at the time and that the current environmental approvals landscape has not changed to any significant extent, making this option still highly unlikely to secure approvals.

Findings: Possible site locations for new storage

The 2016 GHD investigation and report reduced the available water supply options down to the construction of a 100ML storage on-mountain, somewhere in the vicinity of the resort, leaving the only remaining decisions to be the basic concept design and the specific choice of location.

Concept designs were developed by GHD engineers for each potential site using a four stage process:

- Consultation and field inspections with Resort staff to identify the most likely locations, given knowledge of local conditions and operating constraints.
- Stage 1 concept designs for each of three sites, the results of which fed into the MCA process, resulting in the elimination of the one potential site.
- Stage 2 concept designs for remaining two sites.
- Stage 3 refined concept designs following additional studies.

Concurrent with the above process, the concept designs for each of the locations were assessed using a multicriteria analysis framework (MCA) developed for this purpose by GHD. The MCA process was also iterative:

- This process identified major shortcomings for one site, which resulted in its early elimination from the concept design and assessment process.
- The MCA process was repeated for the remaining two sites following the results of additional geotechnical investigations for the preferred site which departed from original assumptions.

Aither has reviewed the methodology employed, the criteria used and the conclusions reached in the design and assessment process. The following comments are made:

- Assessment criteria were appropriately referenced wherever possible against the Alpine Resorts Planning Scheme or specific project objectives.
- The criteria selected seem reasonable and the weighted criteria are appropriate given the nature of the project.
- The second iteration of the MCA process was a sensible approach given the significant change in one of the key assumptions in the concept designs.
- There appears to be some inconsistency between the traffic light results in Table 4 of the 2016 GHD Report and the subsequent commentary in section 6.2, in relation to geotechnical risks. This

may be a function of amended assessment following additional testing and Aither relies on the statement in 6.2 of the report: *“Geotechnical suitability and risk for the Control Centre site was considered to be lower than Tirol following site specific geotechnical investigations (key criteria)” (GHD 2016)*

Conclusions

Within the scope and limitations of this review, the review team is satisfied with the robustness of the on mountain, off stream storage option. We have not identified any reason to dispute the assessment of the preferred location for the new storage based on the information provided to us.

The review team recommends that further assessment be undertaken if the RMB has grounds to believe that any of the assumptions underpinning the limitations on this review need to be reconsidered or if the results of the detailed site investigations and design phase raise issues contrary to the assumptions used to develop concept designs, such as geotechnical conditions or groundwater hydrology at the preferred location.

Credentials of the review team

Chris Olszak

Chris Olszak is an economist who specialises in the Australian water sector. He co-founded Aither in 2012 after previously working with Frontier Economics, URS and Arthur Andersen. Chris directs many of Aither’s engagements across Australia in relation to water infrastructure, water markets and resources, water risk, and water pricing and economic regulation. Chris has worked extensively on economic evaluations of major water infrastructure projects in the rural and urban water sectors for over 15 years including the Melbourne desalination project and the north south pipeline. He has been involved in numerous multidisciplinary options assessment and business case projects for water infrastructure. Chris has recently acted as an expert reviewer for water projects submitted to Infrastructure Australia’s National Infrastructure Pipeline.

Brett Tucker

Brett Tucker’s career in water infrastructure management & construction, resource management and irrigated agriculture has spanned more than 25 years across a broad range roles and organisations, including 15 years experience as a Chief Executive and Board Director in both public and private sector organisations. In 2016 Brett established Blackwatch Consulting, specialising in the provision of strategy, governance, operations and capital projects advice to Government agencies, State-Owned Corporations, Private sector Corporations, industry groups and project consortia. As a Director of Blackwatch and the Peter Cullen Trust, Brett also provides mentoring and coaching support to a number of Senior Managers and prospective industry leaders. Brett holds an Honours Degree in Rural Science and a Graduate Certificate in Accounting and Finance. Brett was awarded a Churchill Fellowship in 1998 and is a Member of the Australian Institute of Company Directors.

CVs of the review team can be provided upon request.